

throughout the state. The use of HOV bypass lanes at metered freeway entrance ramps is also being expanded.

A number of evaluation studies have been conducted on the HOV lanes in the state and monitoring efforts are ongoing. The El Monte Busway, which carries as many people during the peak-periods as the three adjacent freeway lanes, provides one of the best examples of the effectiveness of HOV lanes. There are still a number of issues that will need to be addressed. These include what to do when capacity is reached at the 2+ vehicle occupancy level, additional enforcement activities, and other concerns.

I hope you enjoy the conference this week and have a pleasant stay in Los Angeles. Thank you.

Los Angeles Experience with Bus/HOV Operations *Dana Woodbury, Los Angeles County Metropolitan Transportation Authority*

Thank you, Art. It is a pleasure to have the opportunity this morning to discuss the experience with bus and HOV operations in the Los Angeles area. As you know, we recently had the opportunity to test these systems during the Northridge earthquake. Buses and HOV lanes played vital roles in the emergency efforts, especially along the Santa Monica Freeway. This integral artery, which is the world's most heavily traveled freeway, immediately became the focus for traffic mitigation activities. While the freeway underwent extensive repairs, the left lane was converted into an HOV lane to help traffic flow more freely. This provided carpools with significant travel time savings over SOVs, which had to use local streets in some areas.

Buses were another critical element in the overall response to the earthquake. Within three days, 22 buses were added to routes on the west side and the San Fernando Valley. Within ten days, the MTA created, augmented, or rerouted 27 bus lines to assist earthquake affected commuters. Other transit operators-including the Los Angeles Department of Transportation, Santa Monica Municipal Transit, and Foothill Transit-joined this effort. The extra buses, along with the detour routes and the HOV lanes, made travel from the west side to downtown Los Angeles much easier.

The MTA and Caltrans are working hard to resolve the mobility problems in the Los Angeles area. The MTA's integrated transportation system includes 400 miles of light rail transit (LRT) and subways, which link up with Metrolink, the intercounty commuter rail network, and approximately 1,800 buses. A multimodal approach is needed, however, which encompasses both transit and

freeway elements. HOV lanes are an especially important part of this mix in an automobile oriented society like Los Angeles. HOV lanes for buses, carpools, and vanpools are playing an ever increasing role in Los Angeles' freeway system.

Today, approximately 67 miles of freeway HOV lanes are in operation in Los Angeles County. These facilities carry an average of 1,250 vehicles an hour during the peak-periods. The average vehicle occupancy level on these facilities is 2.3 persons per vehicle. The facilities represent the joint efforts of Caltrans and the MTA, and have been funded through a combination of federal, state, and local sources. Earlier this year the MTA Board committed \$3 15.9 million for construction of the next 88 miles of HOV lanes on nine freeway segments throughout the county. These lanes are expected to be open by 1998. Next month the MTA will release a request for proposal (RFP) for the development of an HOV Master Plan. The plan will help integrate HOV lanes with park-and-ride lots and transit centers. The different freeway corridors will be analyzed to determine where HOV lanes are needed and where cost-effective facilities can be developed. Freeway to freeway HOV connectors will also be examined.

The newly opened Glen Anderson (Century or I-105) Freeway includes direct freeway-to-freeway HOV connections. These ramps appear to be a big bit with carpools. The HOV connectors represent another good example of Caltrans and the MTA working together. The MTA has almost completed the 20-mile LRT METRO Green Line, which is located in the center of the I-105 Freeway. The Green Line will intersect the METRO Blue Line, which runs 22 miles from Long Beach to downtown Los Angeles. When the Green Line opens next year, commuters from El Sagundo and Norwalk will have direct access to downtown by both HOV lanes and METRO. A further bonus will be added in 1995 when Caltrans completes the Harbor Freeway Transitway. This facility, which includes a 3-mile elevated structure, will provide a connection to the El Monte Busway at Union Station. Thus, HOVs will be able to travel from San Pedro to the San Gabriel Valley. Construction will also begin this summer on an HOV project on the Route 118-Sini Valley Freeway.

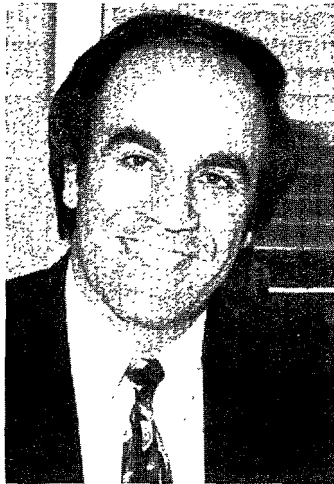
Jerry mentioned the El Monte Busway, which has been in operation for 20 years. For a long time, this single successful project was Los Angeles' only HOV project. It is still working today as some 18,000 daily passengers ride 12 bus routes using the HOV lane. Clearly, adding more HOV lanes will help address mobility problems in the area. By providing a regional HOV system, Caltrans and the MTA are building an integrated network that will help accommodate the mass transit and transportation

demand management needs of the future. An HOV system provides commuters with the incentives of reduced travel times, improved trip reliability, and reduced costs. Further, it will encourage ridesharing.

The 14 million people living in the Los Angeles Basin own 6 million cars. Travel between counties in the area is so essential that transportation planning must consider the surrounding counties, which includes an area of approximately 12 thousand square miles. The total population of the region is expected to increase to between 21 and 23 million over the next 16 years. The number of daily vehicle trips will top 60 million, in 1990. HOV lanes and busways are two techniques that can be used to turn the Los Angeles mobility problem around. Everyone benefits from HOV lanes and busways through improved air quality, reduced congestion, and energy savings. In the long run this will help improve the quality of life in the region.

Developing, Implementing, and Operating an HOV Program for the Los Angeles Area

Raja Mitwasi, California Department of Transportation



Good morning and welcome to Los Angeles. There are over nine million people living in Los Angeles County. Approximately three million people commute to the central business district (CBD) on a daily basis. The freeway system in the county is over 500 miles, which represents only half of the system projected in the mid-1950s. The number of vehicles continue to increase in the region. As a result of these two factors, Los Angeles has some of the busiest freeways in the world.

The development of the HOV system in Los Angeles began in the early 1970s with the opening of the El Monte Busway. As Jerry mentioned, the Santa Monica Diamond Lane project, which converted an existing general purpose lane into an HOV lane, probably set HOV lane

development in Los Angeles back ten years. If this project had not failed, the development of the HOV system would have occurred much sooner. The next HOV lane was opened about ten years later. Since then, research and engineering studies have guided the development of an HOV system in the region.

A video on the HOV system in Los Angeles was presented. The major highlights from this video included the following.

- The El Monte Busway opened in 1974. Initially opened to buses only, carpools of three or more passengers (3 +) were allowed to use the busway starting in 1976. The facility is 11 miles in length and cost \$60 million to construct. The facility provides an HOV lane in each direction of travel. The HOV lanes are separated from the adjacent general purpose lanes by a 14-foot buffer.
- A circular bus station is located at the eastern end of the busway, providing direct access to the busway. A major park-and-ride lot is located around the station. A fly over access ramp is provided at Del Mar Avenue. The station at California State University, Los Angeles features a split roadway and a sky bridge.
- The extension of the busway into downtown Los Angeles, which was built 12 years later, cost \$18 million. It provides access to the downtown street system without returning to the freeway.
- The Route 91 demonstration project re-stripped the median to provide an HOV lane. The eastbound lane cost \$250,000 for eight miles when it opened in 1985. The westbound lane opened in 1993 and cost \$1.1 million.
- The Route 405 (San Diego Freeway) HOV lane opened in 1993. All lanes are 11-foot and the buffer is a 1-foot double yellow line. This facility is being extended north through the interchange with I-105.
- The I-105 (Glen Anderson or Century Freeway), which is 17.3 miles long, will probably be the last new freeway to be constructed in Los Angeles. The facility cost \$2.3 billion. It includes three general purpose lanes, one HOV lane, and a rail line in each direction. There are also six enforcement areas and six ingress/egress points in each direction. There are also direct connections to the future Harbor Freeway Transitway. These are referred to as the fifth level of a four level interchange.
- The HOV lanes on the Route 210 Foothill Freeway opened in January 1994. The 16 mile project cost \$15.4